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CPU MODULE AND INFORMATION PROCESSOR

(57) Abstract

PROBLEM TO BE SOLVED: To meet requirements for improving the radiation efficiency and realizing a small size, by mounting a processor as a bare chip in a cavity and bonding one surface of the chip to a metal plate.

SOLUTION: The central processing unit CPU module 2 comprises a metal plate 102 for diffusing the heat produced in a processor as a base, a high-heating rate CPU bare chip 20 consuming almost the power of the module 2, and CPU module board 101 connected to the chip 20. The processor contacts the metal plate 2 to form a cavity in the module board 101 where main components are mounted such as cache submodule 40, system controller 30 and interface connector 90. The cache submodule 40 is mounted above the processor mounted part, thereby greatly reducing the size.



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CLAIMS

[Claim(s)]

[Claim 1] The system-control circuit which controls transfer of the signal between a processor, the connector which connects with the exterior electrically, and the above-mentioned processor and the above-mentioned connector, In CPU module which consists of a printed circuit board which mounts the above-mentioned processor, the above-mentioned connector, and the above-mentioned system-control circuit The metal plate which was stretched with the above-mentioned printed circuit board in respect of one side, and made the field of another side the shape of an abbreviation flat surface is prepared. CPU module characterized by having formed the mold cavity in the above-mentioned printed circuit board, having carried the above-mentioned processor in this mold cavity section in the state of the bare chip, and joining one field of this bare chip to the above-mentioned metal plate.

[Claim 2] CPU module according to claim 1 characterized by closing the above-mentioned mold cavity section by the member with thermal conductivity lower than the above-mentioned metal plate.

[Claim 3] CPU module according to claim 2 characterized by carrying the 2nd step of substrate in the mold cavity upper part which carried out [above-mentioned] closure through a very small gap, and mounting electronic parts in it at the substrate of eye these two card rows.

[Claim 4] The above-mentioned electronic parts are CPU modules according to claim 3 characterized by being a cache memory and a cache memory controlling mechanism.

[Claim 5] CPU module according to claim 4 characterized by carrying the above-mentioned cache memory in the 2nd above-mentioned step of substrate in the state of a bare chip.

[Claim 6] The above-mentioned connector is a CPU module according to claim 1 characterized by being a thing linked to the memory bus connected with main storage at least, and the system bus linked to an I/O device.

[Claim 7] In the information processor containing the mother board in which semiconductor parts, such as storage, are carried, and the housing which mounts this mother board The connector which connects with the above-mentioned mother board electrically with a processor and the exterior, The system-control circuit which controls transfer of the signal between the above-mentioned processor and the above-mentioned connector, It is CPU module which consists of a printed circuit board which mounts the above-mentioned processor, the above-mentioned connector, and the above-mentioned system-control circuit. The metal plate which was stretched with the above-mentioned printed circuit board in respect of one side, and made the field of another side the shape of an abbreviation flat surface is prepared. Form a mold cavity in the above-mentioned printed circuit board, and the above-mentioned processor is carried in this mold cavity section in the state of a bare chip. The information processor characterized by connecting CPU module which joined one field of this bare chip to the above-mentioned metal plate by the above-mentioned connector area so that the above-mentioned interior of a housing and the field of above-mentioned another side of the above-mentioned metal plate may be touched.

[Claim 8] In the information processor containing the shield enclosure for a shield the mother board in which semiconductor parts, such as storage, are carried, the housing which mounts this mother board, and electromagnetism - The connector which connects with the above-mentioned mother board electrically with a processor and the exterior, The system-control circuit which controls transfer of the signal between the above-mentioned processor and the above-mentioned connector, It is CPU module which consists of a printed circuit board which mounts the above-mentioned processor, the above-mentioned connector, and the above-mentioned system-control circuit. The metal plate which was stretched with the above-mentioned printed circuit board in respect of one side, and made the field of another side the shape of an abbreviation flat surface is prepared. Form a mold cavity in the above-mentioned printed circuit board, and the above-mentioned processor is carried in this mold cavity section in the state of a bare chip. CPU module which joined one field of this bare chip to the above-mentioned metal plate - the above - electromagnetism - the information processor characterized by connecting so that it may constitute as a part of enclosure for a shield

[Claim 9] In the information processor containing semiconductor parts, such as storage, the mother board in which the connector for PC cards is carried, and the housing which mounts this mother board To the field which mounted the above-mentioned connector for PC cards of the above-mentioned mother board, a processor, The system-control circuit which controls transfer of the signal between CPU module connector which connects with the exterior electrically, and the above-mentioned processor and the above-mentioned connector, It is CPU module which consists of a printed circuit board which mounts the above-mentioned processor, the above-mentioned connector, and the above-mentioned system-control circuit. The metal plate which was stretched with the above-mentioned

printed circuit board in respect of one side, and made the field of another side the shape of an abbreviation flat surface is prepared. Form a mold cavity in the above-mentioned printed circuit board, and the above-mentioned processor is carried in this mold cavity section in the state of a bare chip. The information processor characterized by connecting by the above-mentioned CPU module connector area so that CPU module which joined one field of this bare chip to the above-mentioned metal plate may be connected and the above-mentioned interior of a housing and the field of above-mentioned another side of the above-mentioned metal plate may be touched.

[Claim 10] The system-control circuit which controls transfer of the signal between a processor, the connector which connects with the exterior electrically, and the above-mentioned processor and the above-mentioned connector, In CPU module which consists of a printed circuit board which mounts the above-mentioned processor, the above-mentioned connector, and the above-mentioned system-control circuit Prepare a mold cavity in the above-mentioned printed circuit board, and the above-mentioned processor is carried in this mold cavity section in the state of a bare chip. CPU module characterized by the maximum height considering as 10 millimeters or less by having carried out the one side package at the above-mentioned connector, the above-mentioned system controller, and other parts above-mentioned printed circuit boards.

[Claim 11] In the information processor containing semiconductor parts, such as storage, the mother board in which the connector for PC cards is carried, and the housing which mounts this mother board The connector which connects with the above-mentioned mother board electrically with a processor and the exterior, The system-control circuit which controls transfer of the signal between the above-mentioned processor and the above-mentioned connector, The information processor with which it is CPU module which consists of a printed circuit board which mounts the above-mentioned processor, the above-mentioned connector, and the above-mentioned system-control circuit, and the greatest height of the component side of the above-mentioned mother board carried CPU module 10 millimeters or less.

[Claim 12] The system-control circuit which controls transfer of the signal between a processor, the connector which connects with the exterior electrically, and the above-mentioned processor and the above-mentioned connector, In CPU module which consists of a printed circuit board which mounts the above-mentioned processor, the above-mentioned connector, and the above-mentioned system-control circuit The above-mentioned processor to the field where the above-mentioned system controller and the above-mentioned connector are mounted, and an opposite field CPU module characterized by mounting by the metal bump in the state of a bare chip, and for elasticity being in the component side of the above-mentioned bare chip, and the field of an opposite side, and connecting a metal plate through a thermally conductive high buffer.

[Claim 13] The system-control circuit which controls transfer of the signal between a processor, the connector which connects with the exterior electrically, and the above-mentioned processor and the above-mentioned connector, In CPU module which consists of a printed circuit board which mounts the above-mentioned processor, the above-mentioned connector, and the above-mentioned system-control circuit The above-mentioned processor to the field where the above-mentioned system controller and the above-mentioned connector are mounted, and an opposite field CPU module characterized by mounting by the metal bump with the package which exposed only the field without the pad of a silicon chip, and for elasticity being in the component side of the above-mentioned silicon chip, and the field of an opposite side, and connecting a metal plate through a thermally conductive high buffer.

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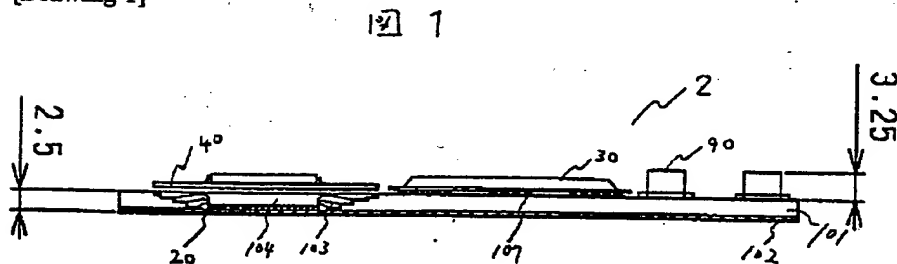
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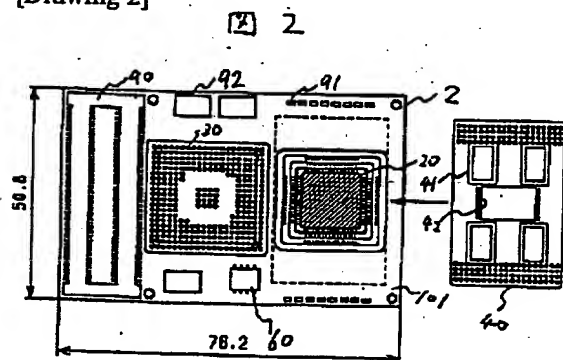
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DRAWINGS

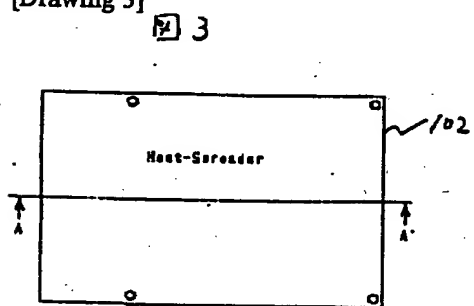
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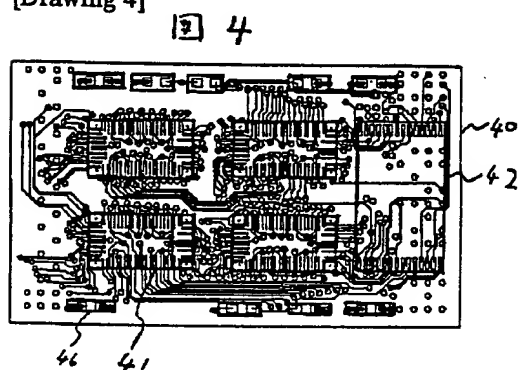
[Drawing 2]



[Drawing 3]

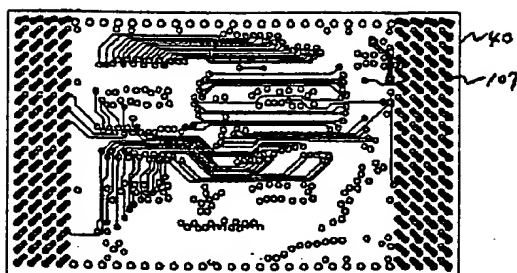


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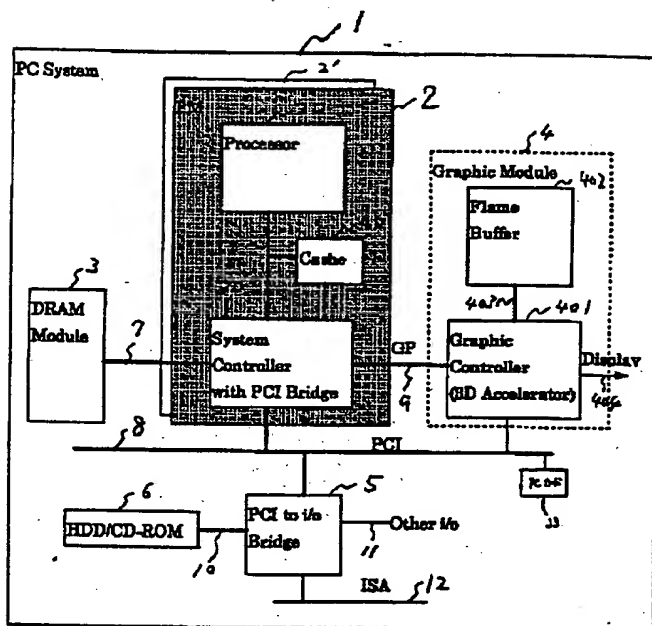
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5



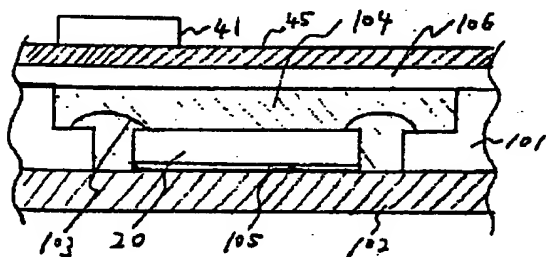
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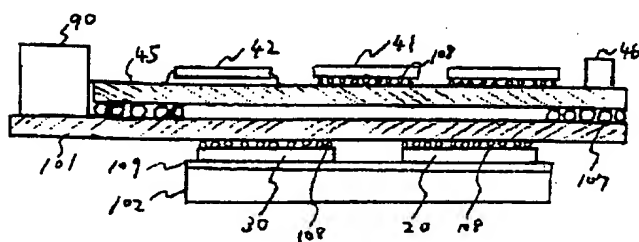
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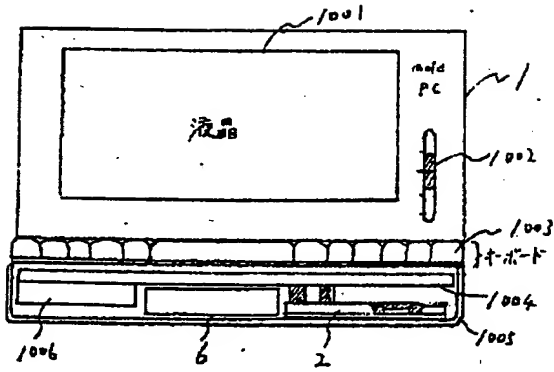
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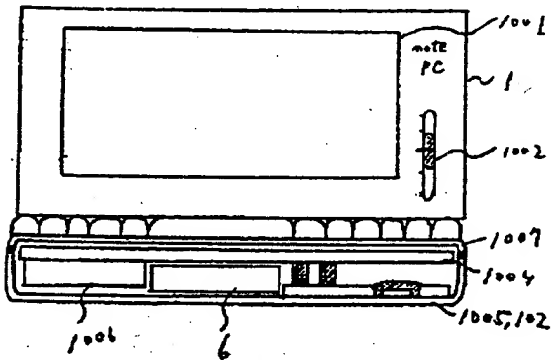
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図 8



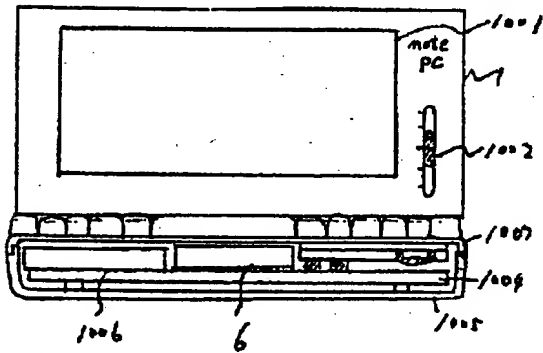
[Drawing 9]

図 9



[Drawing 10]

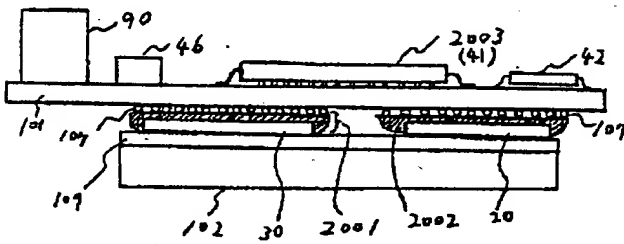
図 10



[Drawing 12]

[illegible]

图 13.



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